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# CURRENT LITERATURE IN AGRICULTURAL ENGINEERING

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## Accidents.

Farm accidents. Montana Farmer. v. 26, no. 6. November 15, 1938.  
p. 11.

## Agricultural Engineering.

Farm engineering. In Part I. Annual report of the Director, Agricultural experiment station, University of Wisconsin, Madison. 1938.  
p. 41-43. Test new equipment for making alfalfa silage. Windrowing alfalfa. Use of a hay harvester. Design an improved molasses pump.

## Agriculture.

- Agricultural experiment station report, two years ended June 30, 1938. Michigan state college of agriculture and applied science. East Lansing, Mich., 1938. 48 p.
- Agricultural outlook for Illinois, 1939. Urbana, Ill., 1938. 32 p. University of Illinois. Agricultural experiment station. Circular 488.
- Costs and returns from farm enterprises from 82 cost-account farms, 1937. By P.S. Williamson. Ithaca, N.Y., 1938. 35 p. New York state college of agriculture. Cornell extension bulletin 395.
- Farm outlook for 1939. Prepared by the Bureau of agricultural economics. Washington, U.S. Govt. print. off., 1938. 44 p. U.S. Department of agriculture. Miscellaneous publication no. 333.
- New systems on Northwest Missouri upland farms. By D.B. Ibach and H.B. Steele. Columbia, Mo., 1938. 32 p. University of Missouri. Agricultural extension service. Circular 391.
- Pioneering in western agriculture; Resume of the first half century of research, 1888-1938, at the Utah agricultural experiment station, including the Biennial report, 1936-1938. Logan, Utah, 1938. 160 p. Utah agricultural experiment station. Bulletin no. 282.
- What's new in farm science. Part I. Annual report of the Director, Agricultural experiment station, University of Wisconsin. Madison, Wisc., 1938. 112 p.



## Air Conditioning.

Air conditioning and health. By A.I. Brown. Ohio state university. Engineering experiment station news. v. 10, no. 5. December 1938. p. 12-13. Field of research on influence of air conditioning upon variety of diseases is promising one and is engaging interest of goodly number of able investigators in fields of physiology, industrial hygiene and public health.

Operation of chemical dehumidifiers in controlling relative humidity is described by Coey before A.S.R.E. Air Conditioning and refrigeration News. v. 25, no. 15. December 14, 1938. p. 9. Table 1. Dew-point variation with dry bulb of air leaving chemical dehumidifiers.

Performance of coils for dehumidifying air. By William Goodman. Heating, Piping, and Air Conditioning. v. 10, no. 11. November 1938. p. 697-701, 707. Methods discussed are equally applicable to direct expansion coils in which temperature of boiling refrigerant is substantially constant, and to counter flow coils in which temperature of water or brine changes. Computations for both types will be discussed in detail. New and simple formulas are developed by the author for computing final dry and wet bulb temperatures of air leaving coil. Particularly note worthy is fact that final wet bulb depression of air is shown to depend upon initial wet bulb depression of air for both direct expansion and counterflow coils. This makes computation of final dry bulb temperature the work of a moment.

Taking the impurities out of air. By H.C. Murphy. Heating & Ventilating. v. 35, no. 11. November 1938. p. 39-41. Air cleaning problem as presented to engineers is complicated both by range in size of dust particle and by diverse nature of impurities to be removed. However, effective equipment to accomplish cleaning is available. Author reviews nature of problem and describes principal features of present day equipment.

Temperature and availability of well water. Heating & Ventilating. v. 35 no. 11. November 1938. p. 51-54. Two principal factors which limit use of well water for cooling air are its availability and temperature. Purpose of section is to give information on both of these.

## Belts.

Belt tension as you like it. By J.R. Hopkins. Power. v. 83, no. 1. January 1939. p. 94-96.

Belts and belt fasteners. By I.G. Dent. St. Paul, Minn., 1938. 1 p. University of Minnesota. Agricultural extension division. Agricultural engineering news letter no. 81.

Making and using leather belts on the farm. By M.K. Thornton, Jr. College Station, Tex., 1935. 4 p. Texas agricultural and mechanical college. Cooperative and extension work in agriculture and home economics. Farm and home hints. no. 341.



## Brooders, Electric

Oregon bottom heat electric brooder. By F.E. Fox, C.J. Hurd and F.E. Price. Rev. Corvallis, Oreg. 1936. 16 p. Oregon committee on electricity in agriculture cooperating with Oregon agricultural experiment station. Progress report 22.

## Building Construction.

Earthquakes and structures. By L.M. Hoskins and J.D. Galloway. Proceedings of the American Society of Civil Engineers. v. 63, no. 10. December 1938. p. 1993-2021. Paper is made up of two sections. Section I, written by Mr. Galloway, refers briefly to work of the Earthquake Committee of Society formed in 1923, and to its report. Nature of earthquake waves is described and some reference is made to their cause, complexity, and characteristics. Some notes are added of relation between earthquake waves and structures that may be subjected to forces arising therefrom. Section II, by Professor Hoskins, considers nature of ground motion, gives certain fundamental rules and conclusions, and investigates theory of flexure of vertical beams subjected to transverse oscillations. Extension of theory to elastic column sustaining load is given in Appendix.

Estimates and costs of construction. By F.W. Stubbs, Jr. New York, John Wiley & sons, inc., 1938. 234 p.

How to build low-cost plank walls and floors. By R.G. Kimbell. American Builder. v. 60, no. 12. December 1938. p. 34-35, 42. Simpler and less expensive methods of floor and wall construction are demonstrated.

Methods of determining the structural properties of low-cost house constructions. By H.L. Whittemore and A.H. Stang. Washington, U.S. Govt. print. off., 1938. 18 p. U.S. National bureau of standards. Building materials and structures. Report BMS2.

Rubble masonry. Washington, D.C. 1924. 5 p. Mimeographed. U.S. Department of agriculture. Bureau of agricultural engineering. Information series no. 54.

Simplified wind-stress analysis of tall buildings. By Otto Gottschalk. Proceedings of the American Society of Civil Engineers. v. 64, no. 10. December 1938. p. 2023-2032. Simple method of analysis explained herein is based on experiments to determine visible model deformations and on studies leading to purely geometrical interpretation of them. Subject has been outlined by writer several times since 1934 in computing inflection points under vertical loads. Structural frame is analyzed by subjecting it to given displacements. Resulting deformations are multiplied by given loads in order to obtain stresses. This process of interpreting model experiment directly avoids need of solving innumerable abstract equations, by introducing only simple expressions for deformation curves. For one-story portal frames, with relatively stiff beams and fixed or hinged column supports, simple formula.



## Building Construction. (Cont'd)

were developed by writer in 1932. Method presented herein applies to frames of any number of stories with any number of bays and with beams and columns having any constant section.

## Building Materials.

Accelerated aging of fiber building boards. By D.A. Jessup. S.G. Weissberg and C.G. Weber. Washington, U.S. Govt. print. off., 1938. 7 p. U.S. National bureau of standards. Building materials and structures. Report BMS4.

Constitution of aluminous cement clinker and reactions of cement with water. Concrete. v. 46, no. 12. December 1938. p. 289.

Grade use guide. American Builder. v. 60, no. 12. December 1938. p. 83. Douglas fir plywood, manufactured and graded under rules and supervision of Douglas fir plywood association.

Proportioning of materials in process of engineering. By J.C. Witt. Concrete. v. 46, no. 12. December 1938. p. 284-287. Example given to illustrate method.

Structural engineering problems; dealing with frames, wind bracing, retaining walls, sheet piling, and wave pressure on breakwaters. By D.A. Molitor. 1st ed. n.p. David A. Molitor 1937. 155 p.

Structural properties of the insulated steel construction company's "frameless-steel" constructions for walls, partitions, floors, and roofs. By H.L. Whittemore, A. H. Stang and V.B. Pholan. Washington, U.S. Govt. print. off., 1938. 18 p. U.S. National bureau of standards. Building materials and structures. Report BMS9.

## Concrete.

Designing workable concrete. By C.A.G. Weymouth. Engineering News Record. v. 121, no. 26. December 29, 1938. p. 818-820. Method of combining sized coarse aggregates to secure workable concrete without raising water-cement ratio.

## Corrosion.

Methods of investigation of surface treatment for corrosion protection of steel. By R.E. Pollard and W.C. Porter. Washington, U.S. Govt. print. off., 1938. 10 p. U.S. National bureau of standards. Building materials and structures. Report BMS8.

## Cotton.

Cotton supply and distribution. Prepared by the Agricultural department committee. Washington, D.C., Chamber of commerce of the United States, 1938. 43 p.



## Cotton. (Cont'd)

Jardine outlines research plans for new cotton uses. Domestic Commerce, v. 22, no. 13. November 10, 1938. p. 276. Tentative research program on cotton lint will include:

1. Agronomic chemical investigations into effect on physical and chemical properties of varietal and cultural differences.
2. Investigation into physical, biological and chemical properties of cotton fiber, with objective of producing more desirable and useful cotton fiber, yarn, fabrics and other materials, and improving cotton materials so as to expand present uses.
3. Investigations into processing of cotton lint from ginning through production of cotton yarns and fabrics, with objective of improving appearance and imparting more desirable properties to cotton textiles
4. Investigations into new methods of processing cotton lint by felting and other means with objective of producing thereby useful materials without employment of spinning and weaving.
5. Investigations into preparation of cotton finishes and into present popular finishing treatments, to improve appearance and usefulness of cotton textiles and to develop in cotton textiles new and more desirable properties.
6. Investigations into transformation of cotton lint by chemical means with objective of producing useful materials.

## Cotton Gins and Ginning.

Improved ginning makes better cotton. By C.B. Sherman. Better crops with plant food. v. 22, no. 10. December 1938. p. 16-18, 44-45.

Preventing gin damage to cotton. By F.L. Gerdes and C.A. Bennett. Washington, U.S. Govt. print. off., 1938. 8 p. U.S. Department of agriculture. Leaflet no. 169.

## Cotton Machinery.

Relation of mechanical harvesting to the production of high-grade cotton. By C.A. Bennett. Cotton Ginners' Journal. v. 10, no. 2. November 1938. p. 5-6.

## Dams.

Earthquake stresses in an arch dam: Discussion. By I.M. Nelidov and H.E. von Bergen. Proceedings of the American Society of Civil Engineers. v. 64, no. 10. December 1938. p. 2045-2046.

Imperial dam and desilting works. Engineering News-Record. v. 121, no. 23. December 8, 1938. p. 736-737. Completion of unique irrigation structure on Colorado River, now ready to serve All-American and Gila canals.

Rebuilding Marshall Creek Dam. Engineering News-Record. v. 122, no. 1. January 5, 1939. p. 23-25. Axis of dam has been moved back somewhat from river, clay soil which was responsible for slide is being



### Dams. (Cont'd)

stripped off to underlying rock and new structure is being built as combined rolled fill and hydraulic fill with flatter slopes than in original structure. More spillway capacity is to be provided.

### Drying (Crops)

Drying grain in windrows before combining may be wise in wet seasons. In Part 1. Annual report of the Director, Agricultural experiment station, University of Wisconsin, Madison. 1938. p. 45.

Use of bituminous coal in the dehydration of alfalfa and other crops. By E.R. Kaiser. Columbus, Ohio, Battelle memorial institute, 1938. 37 p. References. Mimeographed.

### Dynamometer.

Electrical drawbar dynamometer. By H.L. Garver and F.A. Brooks. Agricultural Engineering. v. 19, no. 10. October 1938. p. 431-432. Paper describes design of the dynamometer utilizing electrical principles for indicating horsepower and integrating foot pounds of work. Has advantages of compactness, lightness, and flexibility. It can be adapted to almost any size of tractor and load. If subsequent tests prove it to be as satisfactory as preliminary tests seem to indicate, it should be very useful addition to list of apparatus of every agency making drawbar studies.

### Electric Service.

National electrical code handbook; based on the 1937 edition of the National electrical code. By A.L. Abbott. 4th ed. New York, McGraw Hill book company, inc., 1937. 561 p.

Safety rules for the operation of electric equipment and lines. Washington, U.S. Govt. print. off., 1938. 56 p. National Bureau of Standards. Handbook 34. Comprising part 4 of the fifth edition National electrical safety code.

### Electric Wiring.

Outdoor wiring. By W.C. Harrington. Rev. Amherst, Mass., 1938. 4 p. Mimeographed. Massachusetts state college. Engineering extension series no. 69.

### Electricity on the Farm.

Electric pasteurization of milk. By B.D. Moses. Agricultural Engineering. v. 19, no. 12. December 1938. p. 525-526. References, p. 526. Advantages: 1. Bacteria count is low. 2. Cost of operation is not greatly different from other methods, at least no higher. 3. Control is entirely automatic. 4. Comparatively small floor space is required. 5. Process is continuous and fast, and permits handling of several batches of milk in simple manner. 6. There is definite



Electricity on the Farm. (Cont'd)

check on time and temperature used. 7. There is no local heating.  
8. High quality milk is produced; consumers like it. 9. Cream line is good.

Instruction in rural electrification. By T.E. Hienton. Agricultural Engineering. v. 19, no. 12. December 1938. p. 535. Discussion is not intended to compare relative merits of electric and tractor power, for they are seldom in competition, but to ask whether rural electrification course or courses may not be as important as one or more tractor courses to agricultural engineers and agricultural students now enrolled in agricultural engineering classes.

Light up. Montana Farmer. v. 26, no. 5. November 1, 1938. p. 1, 23. Discussion of advances rural electrification has made in Montana.

Melt the ice off winter income. By G.W. Kable. Electricity on the Farm. v. 11, no. 11. November 1938. p. 6-9. Drinking water warmed to 50° is responsible for an extra dozen eggs per hen - profit eggs. Cow stomachs are costly water heaters. Variety of electric heaters available.

Turn of the switch. By A.B. Rolph. Southern Planter. v. 99, no. 11. November 1938. p. 38-39.

Engineering.

Engineering demands conclusive analysis. By A.E. Morgan. Civil Engineering. v. 8, no. 12. December 1938. p. 795-796. Urges importance of conclusive analysis--analysis that takes into account all possibilities--even in jobs that are ordinarily considered routine.

Engineering's part in the development of civilization. By D.C. Jackson. Mechanical Engineering. v. 60, no. 10. October 1938. p. 745-750. IV. Influence on civilization of further widening of engineering.

Erosion Control.

Erosion control involves special farm management problems. In Part I. Annual report of the Director, Agricultural experiment station, University of Wisconsin, Madison. 1938. p. 27-31. Discusses how erosion control affects plowing costs and feed production.

Erosion control on steep irrigated slopes. By H.E. Reddick and J.G. Bamesberger. Agricultural Engineering. v. 19, no. 12. December 1938. p. 531-534.

Publications on soil conservation and related subjects. Washington, D.C., Soil conservation service, 1938. 8 p. Mimeographed.



Erosion Control. (Cont'd)

Strip cropping for soil conservation. By W.V. Kell and G.F. Brown. Washington, U.S. Govt. print. off., 1938. 40 p. U.S. Department of agriculture. Farmers' bulletin no. 1776.

Evaporation.

Ol' devil evaporation. Arizona Producer. v. 17, no. 15. October 15, 1938. p. 4. Air and sun take heavy toll of moisture needed by Salt River Valley farmers--watershed research upsets many common ideas.

Fans.

Centrifugal exhaust fans. By J.L. Alden. Heating & Ventilating. v. 35, no. 9. September 1938. p. 60-64.

Fan laws and outlaws. By R.W. Smith and T.C. Lloyd. Heating & Ventilating. v. 35, no. 11. November 1938. p. 32-34. Laws of fan performance are simple but their correct interpretation is not always simple matter. Neither are these laws always understandable because of way they are stated. Here is simple statement and some easy-to-understand illustrations of how to judge when fan is reasonably rated.

Fresh air saves wet onions. By Ben Maxwell. Electricity on the Farm. v. 11, no. 11. November 1938. p. 15-16. Discussion of electric blowers.

Farm Machinery and Equipment.

Champion walnut huller and polisher. Farm Implement News. v. 59, no. 26. December 29, 1938. p. 28.

Cleaning gutters no chore. By E.W. McMunn. Ohio Farmer. v. 182, no. 11. November 19, 1938. p. 8. Power conveyor does the work.

Combines in Michigan. In Agricultural experiment station report, two years ended June 30, 1938. Michigan state college of agriculture and applied science, East Lansing. p. 6. Recent survey shows that about 500 new combines were used in 1937 Michigan grain harvest, bringing total up to about 1,000. Most of these are of smaller sizes. Average acreage harvested per combine in 1937 was about 230 acres, compared with 189 in 1936.

Corn planter fertilizer attachments. By M.G. Huber. Agricultural Engineering. v. 19, no. 12. December 1938. p. 523, 526.

Developments in mechanical equipment and methods in sugar beet production. By E.M. Mervine and S.W. McBirney, Washington, U.S. Govt. print. off., 1938. 38 p. "Literature cited:" p. 37-38. U.S. Department of agriculture. Circular no. 488.



Farm Machinery and Equipment. (Cont'd)

Mechanization displacing farm labor. C.S.T.A. Review. no. 16. March 1938. p. 380-382. Displacement of workers, resulting from mechanization of agriculture in United States especially as regards cotton, corn and sugar-beets, was stressed by Lowry Nelson, Professor of Rural Sociology at University of Minnesota, in addressing newly-created Permanent Agricultural Committee of International Labor Office at its first meeting in Geneva in February. At same time, Professor Nelson urged need for continuing study by I.L.O. of progress of mechanization in agriculture.

Mechanizing the corn harvest. By C.K. Shedd, and E.V. Collins. Washington, U.S. Govt. print. off., 1938. 12 p. U.S. Department of agriculture. Farmers' bulletin no. 1816.

When the "40"s roll forth, this industry starts a new cycle of farm equipping. Farm Implement News. v. 59, no. 26. December 29, 1938. p. 19-21.

Fences, Electric

Water users refuse power for electric fence--Urge battery type for safety. By H.J. Lawson. Arizona Producer. v. 17, no. 15. October 15, 1938. p. 1-2.

Fertilizer.

Fertilizing asparagus in South Carolina. By A.B. Bryan. Better crops with plant food. v. 22, no. 10. December 1938. p. 21-22, 43-44.

Filters.

Selection and application of oil filters. By J.I. Clower. Virginia Polytechnic Institute. Technical Topics. v. 8, no. 11. November 1938. 1 p.

Flax.

Trends in the fiber flax industry in Canada. By R.J. Hitchinson. C.S.T.A. Review. no. 17. June 1938. p. 408.

Floods and Flood Control.

Building flood dikes. By Martin Jensen. Montana Farmer. v. 26, no. 6. November 15, 1938. p. 6, 27.

Study in flood waves. By E.E. Moots. Iowa City, Iowa, 1938. 24 p. University of Iowa. Studies in engineering. Bulletin 14.

Utah controlling floods. By Lamont Johnson. Western Farm Life. v. 40, no. 20. October 15, 1938. p. 5, 18.



## Floods and Flood Control. (Cont'd)

Yellow River problem. By O.J. Todd and S. Eliassen. Proceedings of the American Society of Civil Engineers. v. 64, no. 10. December 1938. p. 1921-1991. River problems of North China, aggravated by serious floods and heavy silt loads, have perplexed Chinese for more than 4000 years. Especially has Yellow River taxed ingenuity of their hydraulic engineers, as shown by numerous changes of course this river has taken across Great Plain of North China through recorded history, changes that have meant appalling disasters to population of plain. What Western engineers have learned in recent years about its many-sided problems is outlined in paper. Such evidence as is available is offered to indicate that certain phases of Yellow River problem are much clearer today than they were in 1928 when first attempts were made by Western engineers to probe into hydraulics of this exceptional river and suggest methods for its control and regulation. Proposals for general regulation program are also outlined, based on most recent investigations. These proposals give promise of more adequate flood insurance for population of Great Plain than has existed previously. Since 1919, both writers have been connected with organizations, such as the Yellow River Commission, the Chihi or North China River Commission, and the China International Famine Relief Commission, all of which have been concerned with investigations of this river in modern way. Data presented in this paper have been gathered by these Commissions, or under their direction unless otherwise mentioned.

## Floors.

American hardwood flooring and its uses. By W.L. Neubroch. Washington, U.S. Govt. print. off., 1938. 35 p. U.S. Bureau of foreign and domestic commerce. Trade promotion series no. 186.

## Flow Meters.

Portable valve meter for measuring irrigation water. By J.E. Christiansen. Agricultural Engineering. v. 10, no. 10. October 1938. p. 428. Originally constructed for purpose of measuring water delivered to experimental irrigation plots, and was later improved and used for measuring flow in connection with study of friction losses in concrete pipe lines. Desirable features of measuring water delivered to experimental irrigation plots, and was later improved and used for measuring flow in connection with study of friction losses in concrete pipe lines. Desirable features of meter of this type suggest its adaptability as general-purpose irrigation meter where water is distributed through concrete pipe lines.

## Flow of Water.

Problems of flow of water of special concern to agricultural engineers. By F.C. Scobey. Agricultural Engineering. v. 19, no. 12. December 1938. p. 527-530. References: p. 530.



## Houses.

Historic American buildings survey; Catalog of the measured drawings and photographs of the Survey in the Library of Congress, January 1, 1938. Compiled and edited by J.P. O'Neill. Washington, U.S. Govt. print. off., 1938. 264 p.

Housing research: National bureau of standards. Mechanical Engineering v. 60, no. 10. October 1938. p. 771-772. General objective is stated as follows: To furnish to government agencies, building industry, and public technical information from every available source on engineering properties of building materials as incorporated in structural elements and equipment of house, with particular reference to low-cost housing, and including new materials, equipment, and methods of construction as well as those already in use. Program will include elements suitable for detached houses; row houses, and low-cost apartment houses; it will include new as well as conventional construction; and to restrict it to constructions and equipment suitable for low-cost house, maximum cost has been fixed for each element.

## Hydraulics.

Current waterway studies. By P.W. Thompson. Engineering News-Record. v. 121, no. 26. December 29, 1938. p. 822-824. Current operations of the U.S. Waterways Experiment Station at Vicksburg, Miss., are going far beyond the original conception of function of that laboratory. Table 1. Present operations in hydraulic laboratory of experiment station.

Hydraulic jump in enclosed conduits. By E.W. Lane and C.E. Kindsvater. Engineering News-Record. v. 121, no. 26. December 29, 1938. p. 815-817. Laboratory tests show that momentum theory of jump applies to irregular and enclosed conduits.

Hydraulic jump in trapezoidal channels. By C.J. Posey and P.S. Hsing. Engineering News Record. v. 121, no. 25. December 22, 1938. p. 797-798. Formulas developed provide information useful in preliminary design and selection of economic side slope.

New hydraulic laboratory at St. Anthony falls. Engineering News-Record. v. 121, no. 23. December 8, 1938. p. 725-726. University of Minnesota uses abandoned power site for an unusual laboratory for hydraulic research and testing of hydraulic equipment.

## Hydroponics.

Soilless farming. By V.G. Frost. Farm Journal. v. 62, no. 11. November 1938. p. 9, 32. New facts on feeding field crops (to say nothing of big yields) are furnished by various soilless farming methods.

Use of chemicals in plant breeding. B.R. Nebel and M.L. Ruttle. Farmers Digest. v. 2, no. 5. September 1938. p. 12-14.



Insulation.

Insulation makes house better. Washington Farmer. v. 63, no. 23.  
November 10, 1938. p. 582. Easily applied in new or old construction.

Irrigation.

Alkali and irrigation studies with citrus trees in the Sundays river valley. By J.J. Theron. Pretoria, Union of South Africa, 1937.  
41 p. "Literature cited": p. 41. University of Pretoria. Publication series no. 1: Agriculture no. 40.

America's no. 1 water boy. By F.C. Cross. Western Farm Life. v. 40, no. 21. November 1, 1938. p. 5, 8. Lincoln Fellows.

Art of irrigation. Australian sugar journal. v. 30, no. 6.  
September 10, 1938. p. 371, 373-374. (By H.M.L., in International Sugar Journal, April 1938)

Colorado River goes East. Engineering News-Record. v. 122, no. 1.  
January 5, 1939. p. 17-19. Diversion of part of headwaters of Colorado River eastward under Continental Divide to meet irrigation requirements on east slope has been begun by Bureau of Reclamation. Project includes several dams, canals, 13-mile tunnel and power plants. Initial work will be power supply lines, trans-mountain tunnel and Green Mountain Dam.

Irrigation. In Bulletin no. 282. Utah agricultural experiment station.  
Logan, Utah, 1938. p. 103-108.

Irrigation studies. In Agricultural experiment station report, two years ended June 30, 1938. Michigan state college of agriculture and applied science, East Lansing. p. 6-7. Porous hose system of irrigation calling for minimum of investment is favored by beginner who has necessary labor available for its operation. Development of rotary head sprinkler has shown possibilities of development. Experiments show that spread of 150 feet or more may be secured from well designed sprinkler head although such device has not been developed commercially in this country.

Irrigation with sewage. Engineering News-Record. v. 121, no. 26.  
December 29, 1938. p. 821. Storage lake and land irrigation solve sewage disposal problem at Kingsville, Tex.

Junior irrigation system now on market. In Part I. Annual report of the Director, Agricultural experiment station, University of Wisconsin, Madison. 1938. p. 45-46.

Time of irrigating potatoes as affecting stolon growth and tuber set and development. By W.C. Edmundson. Washington, U.S. Govt. print. off., 1938. 18 p. U.S. Department of agriculture. Circular no. 496.



### Irrigation.

Water and the land. By S. H. McCrory. Agricultural Engineering.  
v. 19, no. 12. December 1938. p. 519-522.

### Land Clearing.

Clearing lands for reservoirs. Engineering News Record. v. 121, no. 16  
October 20, 1938. p. 489-490. Methods for removal of brush and  
trees and estimates of costs given by army engineer.

### Lubrication.

Bath and splash lubrication. By J.I. Clower. Power. v. 83, no. 1.  
January 1939. p. 68-69. Article on lubrication fundamentals out-  
lines two important oiling systems.

### Miscellaneous.

Annual report of the Director of the Civilian conservation corps, fiscal  
year ended June 30, 1938. Washington, U.S. govt. print. off., 1938.  
96 p. Bureau of agricultural engineering, p. 60-61.

Changing values of science. By R.C. Wallace. C.S.T.A. Review.  
no. 18. September 1938. p. 305-312.

### Mississippi River.

Stages of the Mississippi river and of its principal tributaries for  
1936. Vicksburg, Miss., Mississippi river commission. 1938. 120 p.  
U.S. War department. Corps of engineers.

### Motor Fuel.

Auto-ignition and combustion of diesel fuel in a constant-volume bomb.  
By R.F. Selden. Washington, U.S. Govt. print. off., 1938. 13 p.  
References: p. 11-12. Mimeographed. U.S. National advisory  
committee for aeronautics. Report no. 617.

Motor fuels from farm products. By P.B. Jacobs and H.P. Newton.  
Washington, U.S. Govt. print. off., 1938. 129 p. "Literature  
cited": p. 125-129. U.S. Department of agriculture. Miscellaneous  
publication no. 327.

What's next in diesel fuels? By J.M. Drabelle. Power. v. 83,  
no. 1. January 1939. p. 63-65. Modern refining methods bring  
new oils and new problems for the operator--this article tells what's  
happening and what to do about it.

### Oil and Petroleum.

Chemical and refining study of some Wyoming black oils. By H.M. Thorne  
and Walter Murphy. Washington, U.S. Bureau of mines, 1938. 39 p.  
Mimeographed.



## Oil and Petroleum. (Cont'd)

Desalting crude petroleum; Review of the literature. By L.F. Christianson and J.W. Horne. Washington, U.S. Bureau of mines, 1938. 28 p. References. Mimeographed.

Oil and gas development in Illinois in 1937. By A.H. Bell. Reprinted from Trans. A.I.M.E. v. 127, p. 345. 1938. Illinois. Geological survey. Press bulletin no. 31.

Recent petroleum development in Illinois. By A.H. Bell and G.V. Cohee. Reprinted from Bull. Am. Assoc. Petr. Geol. v. 22, p. 649-658, 1938. Illinois, Geological survey. Press bulletin no. 32.

## Oil Burners.

Distillate type oil burner is best kind. By A.C. Jacquot. Washington Farmer. v. 63, no. 21. October 13, 1938. p. 531. Table gives amount of oil required per hour to operate oil burner.

## Paints and Painting.

Cheap paints costly. Lumber & Building Material Dealer. v. 7, no. 8. August 1938. p. 10, 16. "Cheap" paint: 1. Doesn't go as far. 2. Doesn't cover as well. 3. Doesn't wear as well. 4. Costs more to apply. 5. Leaves surface in bad condition for repainting.

Improved field paint sprayer. By G.D. Whitmore. Engineering News-Record. v. 122, no. 1. January 5, 1939. p. 30.

More about fire resisting paint. Lumber & Building Material Dealer. v. 7, no. 8. August 1938. p. 6-7.

Protecting paint buyers. By Clarence Ferguson. Ohio State University. Engineering Experiment Station News. v. 10, no. 5. p. 24-25. One requirement which consumer must meet is that he must properly adhere to recommended conditions for preparation of surface to be painted and apply paint according to directions and under seasonable conditions.

## Patents.

Patents in engineering design. By Adelbert Schapp. Military Engineer. v. 30, no. 174. November-December 1938. p. 438-440. Although paper covers primarily consideration of patents in design of sewage treatment works, principles of law which it elucidates are equally important in designs of all engineering structures.

## Pest Control.

Controlling rats and house mice. By D.W. Hayne and C.H. Jefferson. East Lansing, Mich., 1939. 32 p. Michigan state college. Agricultural experiment station. Circular bulletin 167.



## Pest Control. (Cont'd)

Destructive pests and their control present problems requiring continuous research and new developments. By W.H. Tisdale. Agricultural News Letter (duPont) v. 6, no. 12. December 1938. p. 171-176.

Plant disease control problems. By C.E. Scott. Agricultural Engineering. v. 19, no. 12. p. 530.

Use of vapor spray in plant disease control. By R.M. Merrill. Agricultural Engineering. v. 19, no. 12. December 1938. p. 524. Tests made were primarily to determine effectiveness of applications of vapor spray as compared to same applications by conventional hydraulic sprayer. Fair comparison as to costs and speed of application cannot be made between experimental vapor sprayer used and hydraulic sprayers now in common use. Experimental work with vapor spraying indicates that many materials can be effectively applied in this way, and it seems that question of its adoption by growers is entirely dependant on whether it is possible to obtain unit of sufficient capacity, economy of operation, and freedom of mechanical trouble to compete with conventional hydraulic sprayer.

## Pipes and Piping.

Economic pipe sizes for water distribution systems: Discussion. By T.R. Camp. Proceedings of the American Society of Civil Engineers. v. 64, no. 10. December 1938. p. 2041-2044.

## Plumbing.

Plumbing for the farm home. Part 2. By N.J. Radder. Electricity on the Farm. v. 11, no. 11. November 1938. p. 12-14. Sizes of plumbing fixtures and space required. Pointers on piping, valves and fittings.

## Plywood.

American Douglas fir plywood and its uses. Prepared by Forest products division. Washington, U.S. Govt. print. off., 1937. 41 p. U.S. Bureau of foreign and domestic commerce. Trade promotion series. No. 167.

New methods of finishing plywood. American Builder. v. 60, no. 12. December 1938. p. 47-49.

New standards for plywood industry. By Philip Garland. American Builder. v. 60, no. 12. December 1938. p. 44-45.

Plywood for subfloors - What tests show. By B.L. Grondal. American Builder. v. 60, no. 12. December 1938. p. 57-59.

Plywood in farm construction. By Henry Giese. American Builder. v. 60, no. 12. December 1938. p. 55-56.



### Plywood. (Cont'd)

Plywood progress at the Forest products laboratory. By F.J. Champion. American Builder. v. 60, no. 12. December 1938. p. 53-55. Studies include (1) determinations of strength, rigidity, and lateral stability of plywood of different species and thicknesses and development of methods for calculating strength, (2) strength and moisture resistance of glues and gluing technic used in plywood production, (3) use of plywood in house construction (4) thermal and moisture permeability and fire resistance of plywood of walls and (5) treatment to reduce dimension changes in plywood and otherwise enhance durability and utility of material.

### Poultry Houses and Equipment.

Farm poultry housing. By J.F. McColly and F.E. Moore. Fargo, N.D., 1937. 18 p. North Dakota agricultural college. Extension service. Circular 153.

Fashions in poultry houses. By John Vandervort. Pennsylvania Farmer. v. 119, no. 8. October 8, 1938. p. 178. Illustrations.

New demand for ventilating and heating poultry houses. By J.C. Scott. Agricultural Engineering. v. 19, no. 11. November 1938. p. 479-480. Reasons for expansion of this practice: 1. Ease of keeping individual laying records. 2. If house is of correct dimensions, nearly twice as many birds can be housed as where they run on the floor. 3. Reduced spread of disease. 4. Facilitates exact culling. 5. Timid birds not interfered with by bullies. 6. Replacement hens are not run over or interfered with by the rest of the flock.

Wind-resistant construction of poultry laying houses. By W.C. Harrington. Amherst, Mass., 1938. 6 unnumb. 1. Massachusetts state college. Extension engineering series no. 71.

### Pressure Measurements.

Lateral earth and concrete pressures: Discussion. By R.G. Hennes, R.F. Legget and Charles Terzaghi. Proceedings of the American Society of Civil Engineers. v. 64, no. 10. December 1938. p. 2075-2079.

### Refrigeration.

Bibliography on freezing preservation of fruits and vegetables. By J.L. Berry and H.C. Diehl. Seattle, Wash., Frozen pack laboratory, 1936. 51 p. Mimeographed.

Theory of mechanical refrigeration. By N.R. Sparks. New York, McGraw Hill book company, inc., 1938. 225 p.

### Refrigerator Lockers.

Bibliography on refrigerator lockers; selected list of references. Compiled by D.W. Graf. Washington, U.S. Bureau of agricultural engineering, 1938. 6 p. Mimeographed.



## Refrigerator Lockers. (Cont'd)

Cold storage locker plants becoming popular. In Part I. Annual report of the Director, Agricultural experiment station, University of Wisconsin, Madison. 1938. p. 24-26. No less than 60 cold storage locker plants have been constructed in Wisconsin during past three years. These provide about 8,800 lockers in which both farm and city families store meat, vegetables, fruit, and other foodstuffs at freezing temperatures.

## Research.

Four farm laboratories planned. Farm Implement News. v. 59, no. 26. December 29, 1938. p. 27. Research to be carried on at new laboratories will attack, through science and technology, problem of developing new and extended outlets and markets for main surplus agricultural commodities in four major farm producing areas of country. Basic research on constituents common to agricultural commodities such as starch, cellulose protein, and oil will be carried on, as well as studies looking toward possibilities of utilizing commodities themselves.

## Resins.

Synthetic resins and their raw materials. Washington, U.S. Govt. print. off., 1938. 162 p. U.S. Tariff commission. Report no. 131, second ser.

## Roofs.

Laminated rafter construction. In Agricultural experiment station report, two years ended June 30, 1938. Michigan state college of agriculture and applied science, East Lansing. p. 6. Designs are inherently simple, strong and adaptable, and low in cost.

Survey of roofing materials in the Southeastern States. By H.R. Snoko and L.J. Waldron. Washington, U.S. Govt. print. off., 1938. 23 p. National bureau of standards. Building materials and structures. Report BMS6.

## Septic Tanks.

Marketing a prefabricated septic tank. By M.E. Cook. Agricultural Engineering. v. 19, no. 11. November 1938. p. 473-474, 477.

## Silk-Artificial.

Nylon developed through Du Pont chemical research offers a wholly new and useful synthetic material. Agricultural News Letter. (du Pont) v. 6, no. 12. December 1938. p. 189-190. New synthetic material is outgrowth of research that has covered better part of decade. Its objective was synthesis from readily available native raw materials wholly new group of chemical compounds capable of meeting deficiencies in certain existing industrial materials that in main are now imported.

filos.

Silo pressures and temperatures with corn and grass silage. By J.R. McCalmont and H.E. Besley. Washington, U.S. Bureau of agricultural engineering. 1938. 20 p. Mimeographed.

Silt.

Rate of debris collection by check and storage dams. Engineering News-Record. v. 122, no. 1. January 5, 1939. p. 16. Debris basins prevented disaster to Southern California towns in flood of last March, but water storage reservoirs lost considerable capacity.

Stability of earthen channels. By A.N. Wilson. Indian Engineering. v. 104, no. 3. September 1932. p. 93, 98. V. Practical application of silt effect.

Theory of silt transportation: Discussion. By O.A. Faris and others. Proceedings of the American Society of Civil Engineers. v. 64, no. 10. December 1938. p. 2061-2069.

Transportation of sand and gravel in a four-inch pipe: Discussion. By F.R. Brown and others. Proceedings of the American Society of Civil Engineers. v. 64, no. 10. December 1938. p. 2080-2090.

Snow Surveying.

Costs and benefits of snow-surveying in Utah. By G.D. Clyde. Transactions, American Geophysical Union. 19th annual meeting, April 27 to 30, 1938. Washington, D.C. p. 707-711.

Development of snow-surveying in California. By F.H. Faget. Transactions, American Geophysical Union. 19th annual meeting, April 27 to 30, 1938, Washington, D.C. p. 686-689.

Economic value of snow-surveying for the Los Angeles aqueduct. By J.E. Phillips. Transactions, American Geophysical Union. 19th annual meeting, April 27 to 30, 1938. Washington, D.C. p. 706-707.

Improvement in ski, duralumin sampler, and weighing apparatus. By P.S. Cowgill. Transactions, American Geophysical Union. 19th annual meeting, April 27 to 30, 1938. p. 711-712.

Stevens seasonal snow-rain recorder. By L.E. Rinker. Transactions, American Geophysical Union. 19th annual meeting, April 27 to 30, 1938. Washington, D.C. p. 718-720.

Winter precipitation versus snow-survey for forecasting on Skagit river, Washington. By Robert Leaver. In Transactions, American Geophysical Union. 19th annual meeting, April 27 to 30, 1938. Washington, D.C. p. 695-702.



### Soil Heating.

Tomatoes and their culture in England. By "Ceres". Rural Electrification and electro-farming. v. 14, no. 160. September 1938. p. 50-53. Value of electric soil heating to ensure large and early crops.

### Soils.

Factors contributing to the reaction of soils and their pH measurement. By W.T. McGeorge. Tucson, Ariz., 1938. 126 p. Bibliography: p. 125-126. University of Arizona. Agricultural experiment station. Technical bulletin no. 78.

Graphical representation of the mechanical analyses of soils: Discussion. By F.B. Campbell. Proceedings of the American Society of Civil Engineers. v. 64, no. 10. December 1938. p. 2047-2054.

Important considerations in soil mechanics. By C.A. Hotgentogler and Harold Allen. Bulletin. American Society for Testing Materials. no. 94. October 1938. p. 15-21. Two very important considerations which should receive study in connection with its work in soil mechanics are: 1. That in dealing with fine grain soils we do not have just soil grains surrounded by free water, but instead soil grains encased in film water, with free water in interstices between films, and that effective size of particle is not that of solids but of solid plus film in which solid is encased. 2. That two special studies are urgently needed to determine (a) significance of data furnished by shear tests and (b) to determine means of making data more comprehensive.

Practicing engineer looks at soil mechanics. By G.L. Freeman. Civil Engineering. v. 8, no. 12. December 1938. p. 811-814. Pointing out both its applications and its limitations, and suggesting a brief basic bibliography on the subject.

Recent studies on boron in soils. By J.A. Naftel. American Fertilizer. v. 89, no. 7. October 1, 1938. p. 5-8, 24, 26. References: p. 26. Purpose of paper to show importance of boron in soils as related to agriculture by historically reviewing literature and reporting results of recent studies conducted by author.

Thirty years of soil fertility investigations in South Dakota. By J.G. Hutton. Brookings, S. Dak., 1938. 110 p. South Dakota state college of agriculture and mechanic arts. Agricultural experiment station. Bulletin 325.

### Soybeans.

Soybean industry; selected list of references on the economic aspects of the industry in the United States, 1900-1938. By H.E. Hennefrund and E.M. Colvin, under the direction of M.G. Lacy. Washington, D.C., Bureau of agricultural economics, 1938. 474 p. Mimeographed. U.S. Department of agriculture. Bureau of agricultural economics. Bibliography no. 74.

### Storage of Farm Produce.

Utilization and storage of Florida grapes. By O.D. Abbott and K.W. Loucks. Gainesville, Fla., 1938. 1 1/4 p. University of Florida. Agricultural experiment station. Bulletin 329.

### Surveying.

Manual of instructions for the survey of the public lands of the United States, 1930. U.S. General land office, Washington, U.S. Govt. print. off., 1934. 530 p.

### Tennessee Volley Authority.

How cheap electricity pays its way. Tennessee valley authority. Washington, U.S. Govt. print. off., 1938. 31 p.

To keep the water in the rivers and the soil on the land; Story of TVA. Tennessee valley authority. Washington, U.S. Govt. print. off., 1938. 61 p.

### Terracing.

Farming level terraces in the Dust Bowl. By F.C. Newport and R.R. Hinde. Soil Conservation. v. 4, no. 5. November 1938. p. 115-118. Cropping level terraces in Dust Bowl may be considered as attempt to use efficiently moisture that has been stored before planting time or which may be encouraged to soak into ground during growing season, to ensure proper growth of best adapted crops and to provide enough litter therefrom to protect land against wind erosion.

Fresno terraces. By F.C. Newport. Soil Conservation. v. 4, no. 5. November 1938. p. 125-126, 128. Tricks of trade in constructing fresno terraces are: 1. Backfurrow two parallel strips proper distance from each other to make desired terrace base width. 2. Drive at right angles across plowed strips and load fresno while approaching unplowed strip. Loading on a circle may cause the traces or tugs to rub the hind legs of the team. 3. Unload fresno on same line at each side of terrace core to make curves smooth and width uniform. 4. Dump each load of dirt snugly against previous one and avoid gaps or low places in ridge between dumps. 5. Set fresno so that it loads and unloads easily--about third hole from bottom. 6. Dump fresno while it is moving. 7. Plow ground close enough to break up all land streaks.

### Tires.

Anti-freeze for tractor tires. Pennsylvania Farmer. v. 119, no. 10. November 5, 1938. p. 242. Table gives chart.

Low pressure pneumatic tires for use on muck soils. In Agricultural experiment station report, two years ended June 30, 1938. Michigan state college of agriculture and applied science, East Lansing. n. 6. Disturbed soil less, slipped less, and as measured by dynamometer tests,



## Tires. (Cont'd)

percentage of pull to weight of tractor was 58 for dual spade lug pneumatic tires, as compared with 48 for steel wheel spade lugs.

Weighting air tires on tractors. By I.W. Dickerson. Pennsylvania Farmer. v. 119, no. 8. October 8, 1938. p. 174.

## Tractors.

1939 tractor preview. Market Growers Journal. v. 63, no. 10. November 15, 1938. p. 505, 508-509. Notable advances made in special designs for intensive farming. Planting to harvesting operations move on rubber, Greater speed, power, flexibility and economy in newest models.

## Ventilation.

Field measurements and their interpretation. By J.L. Alden. Heating & Ventilating. v. 35, no. 11. November 1938. p. 47-50. Discussion of exhaust ventilation.

Horizontal framing provides good ventilation for chopped hay. In Part I. Annual report of the Director, Agricultural experiment station, University of Wisconsin, Madison. 1938. p. 43-44. Effect of horizontal framing is to hold up chopped hay on outsides of bent while it settles in middle, thus causing cracks to extend into hay. Also, settling of hay directly under timbers allows air spaces to develop there.

## Walls.

How to build leaky brick walls with good materials. By A.B. MacMillan. Engineering News Record. v. 121, no. 22. December 1, 1938. p. 707-708.

Structural properties of six masonry wall constructions. By H.L. Whittemore, A.H. Stang and D.E. Parsons. Washington, U.S. Govt. print. off., 1938. 31 p. U.S. National bureau of standards. Building materials and structures. Report BMS5.

Wall construction. Architectural Record. v. 84, no. 5. November 1938. p. 137. Scale drawings.

Wall construction for air-conditioned houses and for refrigerated storages. By W.V. Hukill. Washington, U.S. Bureau of agricultural engineering 1938. 8 p. Mimeographed.

Water permeability of masonry walls. By C.C. Fishburn, David Watstein and D.E. Parsons. Washington, U.S. Govt. print. off., 1938. 35 p. U.S. National bureau of standards. Building materials and structures report BMS7.

Why not build your garden walls of earth? By R.L. Patty. American Home. v. 20, no. 3. August 1938. p. 12, 58-60.



### Waste Products.

Preliminary estimates of farm products, by-products and wastes available for industrial use. Prepared by The Committee of the U.S. Department of agriculture on industrial utilization of farm products and by-products. Washington, Bureau of chemistry and soils, 1935. 34 p. Bibliography. Mimeographed.

### Water, Underground

Spreading water for storage underground. By A.T. Mitchelson and D.C. Muckel. Washington, D.C., 1937. 80 p. U.S. Department of agriculture. Technical bulletin no. 578.

### Water Conservation.

Conserving irrigation water. By M.R. Kulp. Moscow, Idaho, 1938. 11 p. University of Idaho. Extension division. Extension circular no. 61.

First biennial report of the Water conservation board of the state of Idaho, 1937-1938. Boise, Idaho. 1938. 47 p.

Use--don't lose flood water. By T.B. Holker. Montana Farmer. v. 26, no. 6. November 15, 1938. p. 3.

### Water Rights.

Brief of State board of water engineers of Texas in the matter of: Treaty between the United States of America and the Republic of Mexico respecting the division and diversion of the waters of the lower Rio Grande between the two countries. Prepared by J.E. Sturrock. Austin, Tex., 1938. 110 p.

### Water Supply.

Establishing first-year normals on basis of accumulated snowfall and some forecasts from runoff ratios. By R.C. Farrow. Transactions, American Geophysical Union. 19th annual meeting, April 27 to 30, 1938. Washington, D.C. p. 689-695. Paper deals with methods and their application in particular case.

Iowa precipitation studies. By Iowa state planning board in cooperation with the Institute of hydraulic research. Ames, Ia., Committee on water resources. 1938. 15 p. References. Mimeographed.

Report of the Committee on snow, 1937-38. J.E. Church, chairman. Reno, Nevada, Nevada agricultural experiment station, 1938. 281-314 p. Reprinted from Transactions of the American geophysical union, Nineteenth annual meeting, 1938. Processed.



## Water Supply, Rural

More milk and richer. By E.R. Meacham. Electricity on the Farm. v. 11, no. 12. December 1938. p. 11-12. "Watering milk"-- through the cow--not only increases the quantity, but results in 10.7 percent more butterfat.

Shallow-well water system. By C.N. Turner. Ithaca, N.Y., 1938. 14 p. New York state college of agriculture. Cornell extension bulletin 392.

## Waterlogging.

Waterlogging in the land of five rivers. By N. Gopal. Indian Engineering. v. 104, no. 3. September 1938. p. 95-96. Discusses remedies by tube wells and lining of canals.

## Weeds.

Preliminary investigation of the relative effectiveness of various chemicals in the control of some common weeds. By C.A.N. Smith. Journal of the Department of agriculture of South Australia. v. 41, no. 11. June 1938. p. 921-931. "Literature cited" p. 931. Paper presents results of three experiments conducted in pots to investigate effectiveness of more commonly used plant poisons. In first two experiments sulphuric acid, sodium chlorate, and arsenic pentoxide were employed in varying strengths, while in third experiment ammonium thiocyanate was also used.

Weed control. In report of the Dominion experimental substation, Regina, Sask., 1931 to 1936. Dominion of Canada. Department of agriculture. Dominion experimental farms. Ottawa, 1938. p. 12-21.

## Wheels.

Disappearing tractor lugs retract within rim. Popular Mechanics. v. 70, no. 3. September 1938. p. 406. Long, spiked or wedge-shaped lugs are attached to edge of circular metal plate inside wheel, so as to pivot freely. Plate is revolved by hand crank, pushing out or withdrawing lugs through slots in wheel surface, extending out as far as five and one-half inches. Inventor found he could save both fuel and time with retractable lugs, plowing considerably more ground with lugs withdrawn than extended, on same amount of fuel.

Studies of tractor wheel performance. By S.J. Wright. Implement and Machinery Review. v. 64, no. 762. Oct. 1, 1938. p. 597-598. 2. Tractive efficiency test of a steel wheeled tractor.

### Wheels. (Cont'd)

Studies of tractor wheel performance. By S.J. Wright and J.S. Wilson. Implement and Machinery Review. v. 64, no. 763. November 1, 1938. p. 693-695. 3. Analysis of wheel efficiency.

Tractor's wheels adjustable to any farm job. Popular Mechanics. v. 70, no. 1. July 1938. p. 58. Rear wheels are adjustable from fifty-six to eighty-four inches, four inches at time, and front wheels may be set from fourteen to fifty-six inches. No special tools are needed for setting the wheels. Front and rear wheels may be changed from standard fifty-six inch tread for road work to any setting desired for row crops planted from fourteen to sixty inches apart, including listed crops. As front wheel setting is changed, wheel base is lengthened or shortened.

### Wind Mills.

✓ Wind-driven generator charges batteries. By C.A. Crowley. Popular Mechanics. v. 70, no. 1. July 1938. p. 146-151.